

Abstract Submitted
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Dust radiation and imaging in tokamak plasmas¹ R.D. SMIRNOV, J.H. YU, S.I. KRASHENINNIKOV, A.YU. PIGAROV, M. ROSENBERG, D.A. MENDIS, University of California San Diego — Dust in fusion devices presents safety and operational concerns for future reactors such as ITER. One of the techniques used for surveying and studying dust in tokamak plasmas is imaging of the dust particles by fast cameras. The imaging is possible because heating and ablation of the dust by impinging plasma particles creates two sources of radiation: thermal radiation from the heated dust particle and radiation from the ablation cloud interacting with the surrounding plasma. The spatial and spectral characteristics of the radiation can provide information as on dust (size, temperature, composition), as well as on dust-plasma interaction processes (ablation dynamics, local plasma parameters). In this work we calculate the spectrum and intensity of both the thermal radiation from a carbon dust particle and the radiation from the ablation cloud surrounding it for various plasma parameters. The possibility to detect each component of the radiation by modern fast framing cameras for different dust sizes is evaluated. This allows to estimate minimal size of the visible dust and the ablation cloud characteristics, which are important for evaluation of dust contribution in the plasma contamination.

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